

Claims:

1. A spectrophotometric system comprising:

- (a) an integrating sphere that includes a sample port, an SCE measurement
5 port and an SCI measurement port;
- (b) a first plurality of mirrors positioned relative to said integrating sphere for
reflecting and directing an SCE beam emitted from said integrating sphere
toward an SCE fiber block;
- (c) a second plurality of mirrors positioned relative to said integrating sphere
10 for reflecting and directing an SCI beam emitted from said integrating
sphere toward an SCI fiber block; and
- (d) first and second focusing lenses positioned intermediate said first and
second plurality of mirrors, respectively, for focusing said SCI and SCE
beams, said first and second focusing lenses being mounted to a lens
15 carrier that is movably mounted relative to said integrating sphere; and
- (e) a drive mechanism that is coupled to said lens carrier and operative to
reposition said lens carrier relative to said integrating sphere.

2. A spectrophotometric system according to claim 1; further comprising a reference
beam measurement port defined in said integrating sphere.

20 3. A spectrophotometric system according to claim 2, wherein a reference beam is
emitted from said reference beam port, and wherein said reference beam, said SCE
beam and said SCI beam are simultaneously processed by a processor associated with
said spectrophotometric system.

4. A spectrophotometric system according to claim 1, wherein said drive mechanism includes a stepper motor.
5. A spectrophotometric system according to claim 1, further comprising a positioning slide which interacts with said lens carrier to facilitate translation of said lens carrier relative to said integrating sphere.
6. A spectrophotometric system according to claim 1, wherein said lens carrier and said first and second focusing lenses defines a zoom lens assembly, and wherein said zoom lens assembly is configured to create an equal path length for the SCE and SCI beams.
- 10 7. A spectrophotometric system according to claim 6, wherein said zoom lens assembly is effective for measuring multiple areas of interest on a sample as to both transmission and reflectance.
8. A spectrophotometric system according to claim 1, further comprising an aperture plate detection assembly.
- 15 9. A spectrophotometric system according to claim 8, wherein said aperture plate detection assembly includes an aperture plate holder, a detection disk and an aperture plate.
10. A spectrophotometric system according to claim 9, wherein said detection disk includes a plurality of sensors deployed in a predetermined manner, and wherein said aperture plate includes an activation ring that engages a preset fraction of said plurality of sensors.
- 20 11. A spectrophotometric system according to claim 9, wherein said aperture plate holder includes a plurality of magnets for magnetic engagement with said aperture plate.

12. A spectrophotometric system according to claim 1, further comprising a sample holder assembly that includes a sample holder and a gas spring for dampening movement of said sample holder relative to said integrating sphere.

13. An aperture plate detection assembly for use with a spectrophotometric system, said
5 aperture plate detection system comprising:

(a) an aperture plate holder defining a cavity region and a plurality of magnets directed toward said cavity region;

(b) a detection mechanism mounted with respect to said aperture plate holder, said detection mechanism including a sensor system for use in identifying
10 an aperture plate mounted with respect thereto; and

(c) an aperture plate dimensioned and configured for mounting with respect to said cavity region of said aperture plate holder, said aperture plate including a structural member for interacting with said sensor system to identify said aperture plate.

14. An aperture plate detection system according to claim 13, wherein said sensor system includes a plurality of sensors deployed in a predetermined pattern for identifying aperture plates mounted with respect to said aperture plate holder.

15. An aperture plate detection system according to claim 13, wherein said sensor system includes an elastomeric connector that is positioned for interacting with an annular
20 groove formed on an underside of said aperture plate.

16. An aperture plate detection system according to claim 13, wherein said detection mechanism is adhered to said aperture plate holder.

17. A zoom lens assembly for use with a spectrophotometric system, said zoom lens assembly comprising:

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- (a) a lens carrier that is movably mounted with respect to a base, said lens carrier including first and second focusing lenses fixedly mounted with respect thereto;
- (b) a drive mechanism that is coupled to said lens carrier for effecting axial translation of said lens carrier relative to said base.